

Wastewater Treatment Facility

Berlin's Pollution Control Facility processed 666.38 million gallons of sanitary sewer flows and another 17.314 million gallons of Leachate from the Mt Carberry Landfill last fiscal year. We also accepted and treated almost 220,780 gallons of septage waste from outlying communities not on their own sewer systems (ie, septic tanks) last fiscal year.

In the process, we produced 1301.07 tons of dried municipal sludge which we trucked to the AVRRDD landfill for disposal. The treatment process removed 95.5% of the BOD (Biochemical Oxygen Demand) and 97.6% of the TSS (Total Suspended Solids) which came in with the sanitary sewer flows.

Average power usage per day at the Main Plant increased to 1815.5 kWh and at our main pump station at Watson Street decreased to 1151.2 kWh; average monthly peak power usage at the Main Plant remained at 121.9 KW and at our main pump station at Watson Street decreased to 102.8 KW. The decrease at Watson Street Pump Station may be attributable to work on the Sewer System to reduce Inflow and Infiltration.

Maintenance has kept up with our pumping needs, and we emphasize anticipating problems before they strike. We now have a full crew of Operators and

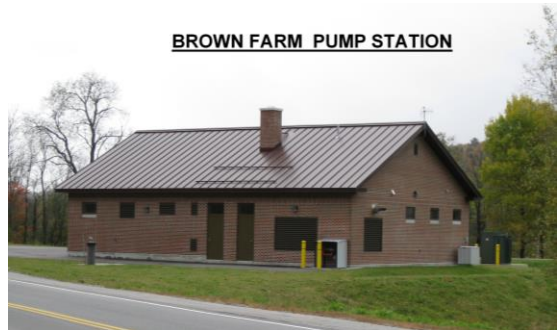
are working on non-routine projects trying to anticipate problems.

We took over operation of the new Brown Farm pump station in September of 2011 and have learned in the ensuing year how to operate the new equipment before the Federal Prison comes online with their design flows and loads.

In December we started to accept Leachate flow from the Androscoggin Valley Regional Refuse Disposal District Landfill at Mt Carberry. This new flow did not create a problem for us this past winter and spring even though it is of a different composition and makeup than what we are designed to treat.

Work on Inflow and Infiltration (I&I) has taken place this year aiming to reduce the surge flows we experience when a heavy or sudden rain descends into the Valley, or snow melts in the Spring, or when the River runs high. As a simple way to think about it, the amount of water Berlin Water

BROWN FARM PUMP STATION



Works (BWW) supplies to the City daily should be the amount of water Berlin Pollution Control Facility (BPCF) treats after traveling through the Sewer Collection System. Last year (FY2012) BWW produced 267.0 million gallons of water for City use; BPCF on the other hand had to treat 666.4 million gallons of City Sewerage, or 250% more than BWW.

The arrival of the Bureau of Prison's medium security Federal Correctional Institute prompted a design review of the Pollution Plant's capability to treat this additional flow. The ongoing problem in Inflow and Infiltration, the age of the extant Facility (33 years), and AVRDD's desire to redirect the Mt Carberry Landfill discharge to this Pollution Plant pointed out that the existing Facility is undersized to treat these new flows adequately. So a plan to upgrade the Facility was commissioned of Wright-Pierce Engineers out of Topsham Maine.

To address the anticipated increase in Flow into the Facility, their design increased the wall height and volume of all of our process tanks; this did not address the 30-year peak flow design requirement, so they recommended a third "secondary" Clarifier be built.

To address the anticipated increase in Loadings into the Facility, they looked at modifications to our "Activated" Sludge system. Specifically, their design recommends more aeration capacity in the form of more and bigger aerators, a modern diffuser system, and automation controls to maintain a "Dissolved Oxygen" set point under all foreseeable operating conditions; their design also recommends increasing our capacity to store and thicken "Sludge"; at improving our ability to "reseed" the "Activated Sludge" under all foreseeable flow conditions; and at giving us the ability to settle out Nutrients (ie, Phosphorus and Nitrogen) within our existing tankage.

The State of New Hampshire would not authorize the continued use of Chlorine for disinfection so a Sodium Hypochlorite disinfection system had to be developed.

All of the underwater concrete of our existing Tanks will be refurbished and resurfaced with a cementitious sealant. New covers for our tanks outside are required by the Building Codes and will be provided.

New Pumps matched to the new flow requirement will be installed with Variable Frequency Drives powering and controlling them.

New Rake Mechanisms for each Clarifier will be installed.

New Instrumentation with Automation Controls to maintain setpoints under varying conditions will be installed for all critical processes. New Programmable Logic Controllers (PLC) will be set up for local control of individual processes. A new Supervisory Control and Data Acquisition (SCADA) system will be designed and implemented for remote control operations and more thorough data acquisition and handling.

Existing Aeration Blowers will be rebuilt and new upsize motors supplied; fiberglass pipe to the Aeration Tanks will be replaced by Stainless Steel ones.

A modular design HVAC system will be provided for climate control, especially in the Laboratory, but that will affect the whole building.

A new Transformer with a higher Amperage rating will be required to power all the new equipment. Several new Motor Control Centers will be strategically located in the Process for better distribution and control.

East Milan Road Sewer Project and Pump Station was Awarded to Sargent Corporation in June 2010 for \$5,422,080

and pump Station was put in service August 2011.

The Phase I Contract 2 of inflow infiltration project was awarded to the Nelson Companies.

Visit us at:

www.berlinnh.gov/Pages/BerlinNH_WasteWater

Respectfully Submitted,
Henry Noel
Waste Water Superintendent

Public Works Services



The Public Works Department provides a number of services to the citizens of Berlin. They include: the maintenance of over 60 miles of streets and many more miles of sidewalks that need to be swept, patched and pavement overlay. We also provide snow removal, street striping, street marking, and the fabrication and installation of street and traffic signs. We construct retaining walls, install guard rails and guard fence. We maintain sewer and storm water collection systems. We provide equipment maintenance for all of the Public Works, Fire, Recreation, Health, Police and Engineering Departments as well as the Berlin Municipal Airport. We maintain gas and fuel distribution system for all City Departments. We also provide

and maintain 151 sand and salt barrels for winter use.

We periodically seal concrete sidewalks, retaining walls and bridge abutments. Members of the Department also provided utility information and project inspection for water and sewer capital improvement projects.

Transportation Street Markings

Center lines, edge lines, railroad crossings and crosswalks were painted as they are every year; we did exclude three exempt railroad crossings this year. The cost of this work is approximately \$11,000. The work includes approximately 220,000 linear feet of striping and 5 railroad crossings. PWD crew paints over 130 crosswalks throughout the City, all the Stop Bars, and Yellow No Parking Zones and the Handicap Parking areas.

Projects Completed in the 2011-2012 Season

Continue to work with NH Trails Bureau and ATV clubs on ATV trails' cross town connection by installing signs, and road markings.

Portions of sidewalks were replaced on Stratford Street, Main Street, Elm Street and High Street; retaining walls and railings on Portland Street, Elm Street were repaired and drain line on Blais Street was replaced. The storm collection system on Hillsboro Street was extended.

Public Works did repairs on Marston School Playground which removed all the old footings and asphalt to make a safer play area. We built new executive parking area for the Middle School.

Solid Waste

The East Milan Road Landfill closure was substantially completed in October of 1996. Closure of the landfill launched the 39 year post-closure monitoring program. Groundwater quality and methane gas production is being monitored in accordance with the program.

The Cates Hill Landfill Closure project was completed in August of 2006.. Groundwater quality and methane gas production is being monitored in accordance with the program. The Cost for Engineering Services, Lab Testing Services, Gas Monitoring, Administrative Services and Grounds Maintenance is almost \$18,000.

The Public Works Department does curbside pickup of household garbage. We take over 4,000 tons per year to the landfill at a cost of \$67/ton = \$268,000.

The Public Works Department collects paper, glass, plastics, tin, aluminum and cardboard for recycling.

Recreation and Parks Maintenance



The maintenance crew for Recreation and Parks is now being directed by the Public Works Director. The past two years have been challenging for us with project completion and field issues. The new field

at the Community College was completed and was left dormant for a couple of years to build up turf strength. We plan to put this field in service next season. Hopefully we are over the hurdle with the major issues with bug infestation and fertilization on our major fields (Memorial, High School and Community College). We have been working with Northeast Agriculture to guide us past these obstacles. In working with Northeast we also gained knowledge that will help us avoid these issues in the future. The fields are currently in the best shape they have been in a long time.

The airless sprayer we purchased has improved our efficiency and quality by reducing man-hour requirements for lining our fields.

Following is a summary of the tasks and services provided by the crew listed by the different seasons.

Winter:(Dec.,Jan, & Feb.)

-Continue with downtown x-mass decorations, repairs, replacements, etc. – All snow, ice, and rain events are attended to as they occur. This involves plowing, shoveling, sanding and salting parking lots, walkways, stairs and entrances. The places we maintain are; 1) Police station-Rec. center, 2) First Ave. parking lots. 3)City Hall 4)Court House 5)Heritage Park 2 lots. 6)Bickford Place. 7) Memorial and Community Fields storage. 8) 5 skating rinks. - We maintain 5 skating rinks as long as weather permits. These rinks are located at Green St., River St., Ramsey Park, Horne Field, and Hutchins Park. – Everyday custodial duties are performed at the Rec. Center, and building is maintained for all winter programs. Equipment maintenance, usually performed during springtime, is started in the garage when the weather is not favorable for skating rink maintenance activities.

Spring: (March, April, & May)

-All equipment is inspected and repaired, painted, or replaced. As snow melts the crew gets outside and starts to "spring clean" (litter pick up, leaves, sweep, and sod repairs) all areas that we take care of. High School baseball and softball games, Boys and Girls Tennis are first on the schedule. They play and practice on the 2 Little League Fields at Community and at Memorial and at the Glen Ave. and Horne Field tennis courts. JV and Varsity play about 20 home ball games not counting playoffs. We started a new field maintenance program with Northeast Agricultural to restore all our fields to excellent condition. The main fields involved in this program are: the new Community College field where the High school will have all their Field Hockey and Soccer practices and games, the High School track field, and Memorial baseball field.

- Grass mowing starts and the cemetery crew from Northern Human Services starts in May. We equip them and service the equipment, but they do a great job mowing and trimming. The Community Gardens are tilled and staked out.

Summer: (June, July, & Aug.)

-High School athletic seasons wind down with playoffs games at Community and Horne Fields. Grass mowing and trimming are everyday tasks. All places we maintain are: Track field, Memorial and Memorial Annex, Green St., Veterans Park, all downtown (Vodoukus, PSNH, Gill, Library, St. Anne, Dead River, all Pleasant St., Green St., and Cole St. islands, Tondreau,) parks, Cleveland Bridge road and Botanical gardens, Central Playground, Community Fields, Skateboard Park, Hutchins park, the ball field at Horne field and playground, Rotary Park, Brown School playground, Ramsey Park playground.

- There is a full schedule of girls' softball (Bobcats) games at Horne Field, Cal Ripken at Community, and their respective tournaments; Summer Soccer league games at Community; summer playgrounds program and free lunches. Field maintenance at all fields is ongoing and includes, aerating, seeding, topdressing, fertilizing and weed-killing. Trash removal, tree pruning, fence repairs, and playground safety, etc., are attended to weekly.

Fall: (Sept., Oct., Nov.)

-There is a very busy fall schedule of High School field hockey and soccer games and practices that start in August. Every day practices at Community Field (soon to be Community College field) for JV and Varsity teams, with 10 home games for each team at the Track field.

-7th and 8th grade soccer and field hockey games and practices are at Horne field and Memorial Annex field -5th and 6th grade soccer and field hockey games and practices are at Memorial and Community fields and Rec. Dept. Soccer program at Green St. Field

-Worn areas of all fields are repaired and the field maintenance program continues; all bleachers, nets, benches, picnic tables, summer equipment, etc. are put away for the winter. The crew also does the downtown x-mass decorating and assists Main St. Program with their decorations also.

Visit us at:

[www.berlinnh.gov/Pages/BerlinNH Public Works](http://www.berlinnh.gov/Pages/BerlinNH%20Public%20Works)

Respectfully Submitted by,
Michael P. Perreault, Public Works Director